

CLAIMS

I claim:

- 1 1. A white light LED, comprising:
2 a semiconductor body formed of a semiconductor layer
3 sequence emitting electromagnetic radiation in a blue spectral
4 range when a forward bias is applied thereto;
5 a luminous material encompassing said semiconductor body,
6 the luminous material being photoexcited by the electromagnetic
7 radiation emission of the semiconductor body; and
8 a chromaticity coordinate-converting casting compound
9 encompassing at least part of the semiconductor body and the
10 luminous material;
11 wherein the LED device has a resultant white light output.

- 1 2. The white light LED according to claim 1, wherein said
2 casting compound comprises a transparent epoxy resin having a
3 tint of predetermined color disposed in said resin.

1 3. The white light LED according to claim 2, wherein said
2 tint is a polycarbonate compatible tint, wherein said tint
3 converts a wavelength falling within a blue wavelength range
4 into a relatively longer wavelength.

1 4. The white light LED according to claim 1, wherein said
2 semiconductor body is a blue light emitting semiconductor body.

1 5. The white light LED according to claim 1, wherein said
2 luminous material is a phosphor exhibiting a yellow luminescence
3 when photoexcited by the electromagnetic radiation emission of
4 said semiconductor body.

1 6. The white light LED according to claim 1, wherein said
2 luminous material is a Ce-doped phosphor.

1 7. The white light LED according to claim 1, wherein said
2 blue light emitting semiconductor body and said luminous
3 material emits an output wavelength in the blue-yellow spectrum.

1 8. The white light LED according to claim 1, wherein said
2 white light output has an approximate correlated color
3 temperature (CCT) between 2,300 and 3,300 Kelvin.

1 9. The white light LED according to claim 1, wherein said
2 white light output has approximate chromaticity coordinates of
3 X-.466 and Y-.442.

1 10. The white light LED according to claim 1, wherein said
2 white light output has a nominal color rendering index (CRI) of
3 85.

1 11. A chromaticity coordinate-converting casting
2 composition for die-level and mixed die white LEDs, the casting
3 composition comprising:

4 a transparent epoxy resin; and
5 a polycarbonate compatible tint dispersed in said
6 transparent epoxy resin, wherein the tint converts a wavelength
7 falling within a blue wavelength range into a longer wavelength.

1 12. The casting composition according to claim 11, wherein
2 said tint is inert to said transparent epoxy resin and die
3 chemicals.

1 13. The casting composition according to claim 11, wherein
2 said tint is chemically stabilized against ultraviolet light.

1 14. The casting composition according to claim 11, wherein
2 said tint is heat-resistant.

1 15. The casting composition according to claim 11, wherein
2 said casting composition has chromaticity coordinates
3 approximately equal to X-.464, Y-.350 and a color temperature of
4 about 1900 Kelvin.

1 16. The casting composition according to claim 11, wherein
2 said tint and said epoxy resin have a dilution ration of
3 approximately 50:1.

1 17. The casting composition according to claim 11, wherein
2 said tint has a formula range of $L^*65.77 - a^*41.27 - b^*62.57 \pm$
3 5.

1 18. The casting composition according to claim 11, wherein
2 said tint shifts the output correlated color temperature from
3 about 6,000 Kelvin to about 3,000 Kelvin.

1 19. A method of adjusting the chromaticity coordinates and
2 color rendering indices of a white LED, the method comprising
3 the step of encapsulating said LED with a chromaticity
4 coordinate altering compound.

1 20. The method according to claim 19, further including
2 the step of forming said chromaticity coordinate altering
3 compound by diluting polycarbonate compatible tint, having a
4 CIE-Lab formula range of $L^*65.77 - a^*41.27 - b^*62.57$ plus or
5 minus 5, with clear epoxy resin with a dilution ratio of 50:1.